

AMENDMENTS TO THE CLAIMS:

Please cancel without prejudice claims 1-21 and substitute newly written claims 22-42 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

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1-21. (*Cancelled*)

22. (*New*) A thermally insensitive photodetector circuit, said circuit comprising:
a phototransistor providing a gain, and
a current load device connected to said phototransistor for providing an output signal having an illumination dependent contribution and a leakage current contribution, said device having a current-voltage characteristic in which voltage is a logarithmic function of current, said phototransistor supplying an output current to the current load device, (said phototransistor further providing a gain sufficiently high that the illumination dependent contribution to the output signal exceeds the leakage current contribution.)

23. (*New*) A photodetector circuit according to Claim 22 which is substantially insensitive to temperature over a range of light intensity and temperature normally to be encountered in a daytime natural environment.

24. (New) A photodetector circuit according to Claim 22 wherein the phototransistor and current load device are fabricated using BiCMOS technology.

25. (New) A photodetector circuit according to Claim 22 wherein the current load device is a MOSFET having one of a source and a drain connected to the phototransistor and the phototransistor is arranged to produce a current low enough to operate the MOSFET in a sub-threshold regime.

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26. (New) A photodetector circuit according to Claim 25 wherein the phototransistor is a bipolar transistor incorporating a photodetecting base region and having an emitter connected to the MOSFET.

27. (New) A photodetector circuit according to Claim 26 wherein the MOSFET and the phototransistor are connected at a common connection point to buffering means and the buffering means is connected to a pixel readout circuit.

28. (New) A photodetector circuit according to Claim 25 incorporating an attenuator for reducing radiation intensity incident on the phototransistor to an extent necessary to provide for phototransistor output current to be low enough to operate the MOSFET in the sub-threshold regime.

29. (New) A photodetector circuit according to Claim 22 wherein the phototransistor gain is sufficiently high that the circuit is operative in environmental temperatures in the range -20°C to 60°C with substantially unaffected sensitivity at illumination levels down to 1 lux.

30. (New) A photodetector circuit according to Claim 29 wherein the photodetector is capable of operation in environmental temperatures ranging from -20 to 60°C with substantially constant contrast sensitivity.

31. (New) A photodetector circuit according to Claim 22 incorporated in an array of like circuits.

32. (New) A photodetector circuit according to according to Claim 31 incorporated in a digital camera.

33. (New) A photodetector circuit according to according to Claim 32 wherein the digital camera is incorporated in an automobile and associated with signal processing means arranged to analyse data received from the digital camera and assist in automobile control.

34. (New) A photodetector circuit according to according to Claim 31 incorporated in hand-held computer apparatus.

35. (New) A photodetector circuit according to according to Claim 31 incorporated in a personal digital assistant.

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36. (New) A photodetector circuit of BiCMOS construction incorporating a phototransistor connected to one of a source and a drain of a MOSFET having a current-voltage characteristic in which voltage is a logarithmic function of current, wherein the phototransistor is arranged to supply an output current to the MOSFET sufficiently low to operate the MOSFET in a sub-threshold regime, the phototransistor and MOSFET are arranged to provide an output signal having an illumination dependent contribution and a leakage current contribution, and the phototransistor provides a gain which is sufficiently high that in operation of the circuit the illumination dependent contribution to the output signal exceeds the leakage current contribution at all normal operating temperatures of the circuit such that the circuit is operative in environmental temperatures in the range - 20°C to 60°C with substantially unaffected sensitivity at illumination levels down to 1 lux.

37. (New) An array of photodetector circuits in which each circuit is of BiCMOS construction and incorporates a respective phototransistor connected to one of a source

and a drain of a respective MOSFET having a current-voltage characteristic in which voltage is a logarithmic function of current, wherein the phototransistor is arranged to supply an output current to the MOSFET sufficiently low to operate the MOSFET in a sub-threshold regime, the phototransistor and MOSFET are arranged to provide an output signal having an illumination dependent contribution and a leakage current contribution, and the phototransistor provides a gain which is sufficiently high that in operation of the circuit the illumination dependent contribution to the output signal exceeds the leakage current contribution at all normal operating temperatures of the circuit such that the circuit is operative at temperatures in the range -20°C to 60°C with substantially unaffected sensitivity at illumination levels down to 1 lux.

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38. (New) A method of detecting radiation having the steps of:

- a) providing a photodetector circuit incorporating a phototransistor and a current load device having a current-voltage characteristic in which voltage is a logarithmic function of current,
- b) arranging the phototransistor to supply an output current to the current load device to produce an output signal having an illumination dependent contribution and a leakage current contribution, and
- c) arranging the phototransistor to receive incident radiation and operating the photodetector circuit in such a way that the phototransistor provides a gain which is sufficiently high that the output signal illumination dependent contribution exceeds the

leakage current contribution at all normal operating temperatures of the circuit such that the circuit is substantially temperature insensitive.

39. (New) A method according to Claim 38 wherein the photodetector circuit is fabricated in BiCMOS.

40. (New) A method according to Claim 38 wherein the current load device is a MOSFET and the method includes the step of attenuating radiation intensity incident on the phototransistor to provide for phototransistor output current to be low enough to operate the MOSFET in a sub-threshold regime.

41. (New) A method of detecting radiation having the steps of:

- a) providing a photodetector circuit of BiCMOS construction incorporating a bipolar phototransistor with a photodetecting base region and having an emitter connected to one of a source and a drain of a MOSFET having a current-voltage characteristic in which voltage is a logarithmic function of current,
- b) arranging for the phototransistor to supply to the MOSFET an output current which is low enough to operate the MOSFET in a sub-threshold regime and thereby to produce an output signal having an illumination dependent contribution and a leakage current contribution, and

c) arranging the phototransistor to receive incident radiation and operating the photodetector circuit in such a way that the phototransistor provides a gain which is sufficiently high that the illumination dependent contribution to the output signal exceeds the leakage current contribution at all normal operating temperatures of the circuit such that the circuit is operative in environmental temperatures in the range -20°C to 60°C with substantially unaffected sensitivity at illumination levels down to 1 lux.

42. (New) A method of detecting radiation having the steps of:

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a) providing an array of photodetector circuits of BiCMOS construction, each circuit incorporating a respective bipolar phototransistor with a photodetecting base region and having an emitter connected to one of a source and a drain of a respective MOSFET having a current-voltage characteristic in which voltage is a logarithmic function of current,

b) arranging for the phototransistors to supply to respective MOSFETs output currents sufficiently low to operate each MOSFET in a sub-threshold regime and thereby to produce circuit output signals each having an illumination dependent contribution and a leakage current contribution, and

c) arranging the phototransistors to receive incident radiation and operating each photodetector circuit in such a way that the respective phototransistor provides a gain which is sufficiently high that the illumination dependent contribution to the respective output signal exceeds the leakage current contribution at all normal operating

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in the range -20°C to 60°C with substantially unaffected sensitivity at illumination levels
down to 1 lux.
